New Frontiers
Announcement of Opportunity
NASA Launch Services

NASA Headquarters

Office of Space Flight

Space Access

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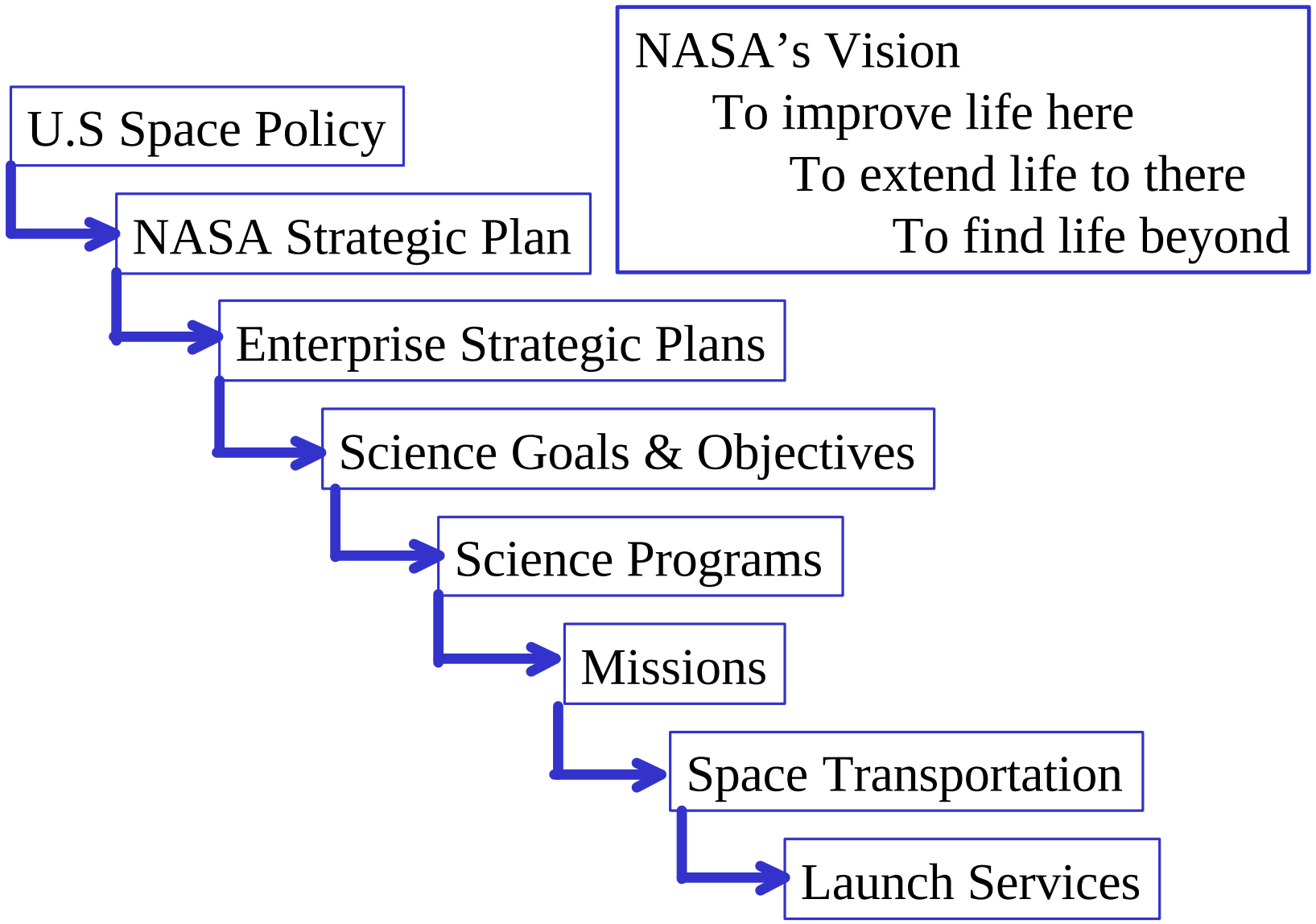
National Space Policy to Launch Service



Launch Services Organization

- The Launch Services Program is Responsible for:
  - **Identify and Aggregate Agency Launch Requirements**
  - **Assure Access to Space on All Available Launch Systems**
    - Shuttle
    - DOD
    - Commercial Launch Vehicles
    - Foreign Vehicles
  - **OSF is the front door to Agency/DOD payload customers**
  - **Lead HQ strategy for meeting requirements/managing priorities/conflicts**
  - **Integrate manifest process for both Shuttle and ELV**
  - **Program Direction for Launch Service Program**
  - **Identify/acquire new launch services**
  - **Agency technical lead for space transportation policy discussions**
  - **Provide Single Interface for Enterprise Payload Customer at Headquarters**
  - **Space Access manifest - NASA Flight Planning Board**

NASA LAUNCH SERVICE
PRIMARY PAYLOAD

- **SCIENCE ENTERPRISE AO**
  - **PROPOSALS TO MEET SCIENTIFIC OBJECTIVES OF THE AGENCY**
  - **AO PROVIDES GUIDELINES FOR SPACECRAFT AND LAUNCH VEHICLE**

- **THE PROPOSAL(S) SELECTION ON SCIENTIFIC MERIT**

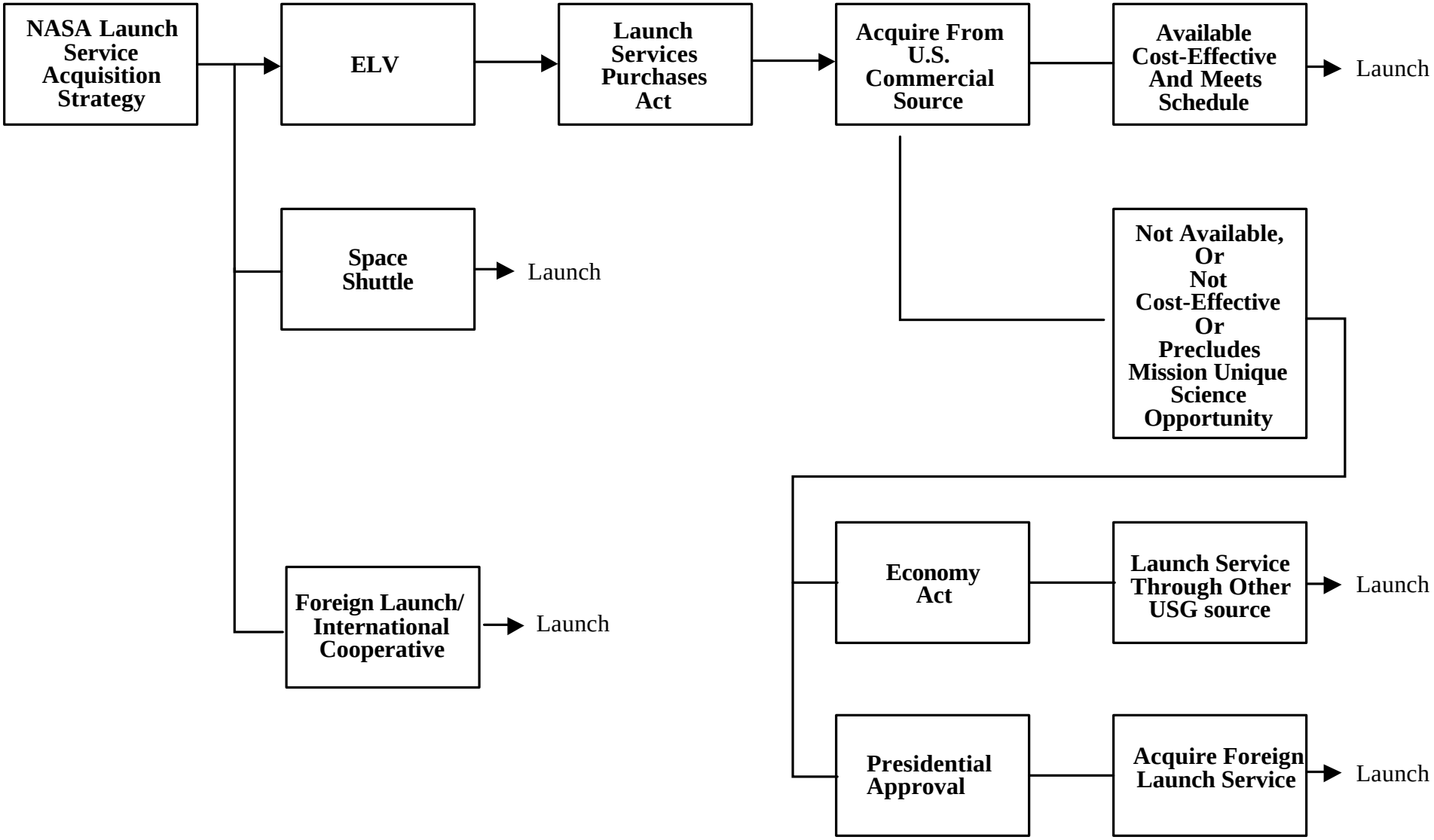
- **SCIENCE ENTERPRISE BRINGS THE NEW REQUIREMENT TO THE FLIGHT PLANNING BOARD**

- **LAUNCH SERVICE REQUIREMENT EVALUATED BY FLIGHT PLANNING BOARD**
  - **RISK**
  - **LAUNCH DATE**
  - **LAUNCH VEHICLE (Availability, launch history)**
  - **LAUNCH SERVICE CONTRACT**

- **KSC LEAD CENTER TO PROCURE & MANAGE LAUNCH SERVICE**

NASA Launch Alternatives

LAUNCH SERVICES



NASA LAUNCH SERVICES

- **Domestic Expendable Launch Services - Procured and managed by NASA**
- **Two service providers - Intermediate & Heavy performance classes**
- **AO Proposers - Dual compatible with both families of launch vehicles within the proposed performance class**
- **AO Proposers should not attempt to discern differences in risk or costs within each launch vehicle performance class**
- **Launch Service costs – Costs for vehicle classes are provided in the New Frontiers AO Library**

Alternate Launch Services

- **Foreign Launch Services**
  - **International Cooperative Agreement – No funds exchanged basis**
  - **Non Nuclear Payloads Only**
  - **Address export control & technology transfer issues**
  - **Launch vehicle availability**
  - **Consistent with NASA NPD 8610.7**
    - **Flight history**
    - **Technical risk mitigation**
    - **Costs - Technical insight & risk mitigation**
    - **Evaluated on case-by case basis**

- **Dual manifest or secondary payloads on domestic LV's will not be considered under this AO**

NASA ELV Policies

- NASA Launch Services is governed/driven by the following Agency-level NASA Policy Directives (NPD):
  - NPD 8610.7, Launch Services Risk Mitigation Policy for NASA-Owned Or NASA-Sponsored Payloads
  - NPD 8610.23A, Technical Oversight of Expendable Launch Vehicle (ELV) Launch Services
  - NPD 8610.24A, Expendable Launch Vehicle (ELV) Launch Services Pre-launch Readiness Reviews

NASA LAUNCH RISK MITIGATION POLICY

- **LAUNCH SERVICES RISK MITIGATION POLICY FOR NASA-OWNED OR NASA SPONSORED PAYLOADS (NPD 8610.7 2/4/99)**
- **ESTABLISHES PROCESS TO ASSESS MISSION RISK BASED ON VEHICLE MATURITY AND DEMONSTRATED FLIGHT HISTORY**
- **THREE CATEGORIES OF RISK:**
  - **CAT 1: MISSIONS DEEMED NON MISSION CRITICAL CAN BE CONSIDERED FOR FLIGHT ON VEHICLES WITH NO FLIGHT HISTORY**
  - **CAT 2: MISSIONS DEEMED MISSION CRITICAL TO ENTERPRISE STRATEGIC PLAN AND OF MODERATE COST/COMPLEXITY CAN BE FLOWN ON NASA-ACQUIRED SERVICES WITH AT LEAST ONE DEMONSTRATED FLIGHT**
  - **CAT 3: MISSIONS DEEMED MISSION CRITICAL WITH COMPLEX INTERFACE AND HIGHER COST TO BE FLOWN ON VEHICLES WITH DEMONSTRATED FLIGHT HISTORY (14 CONSECUTIVE FLIGHTS)**

NASA LAUNCH SERVICES

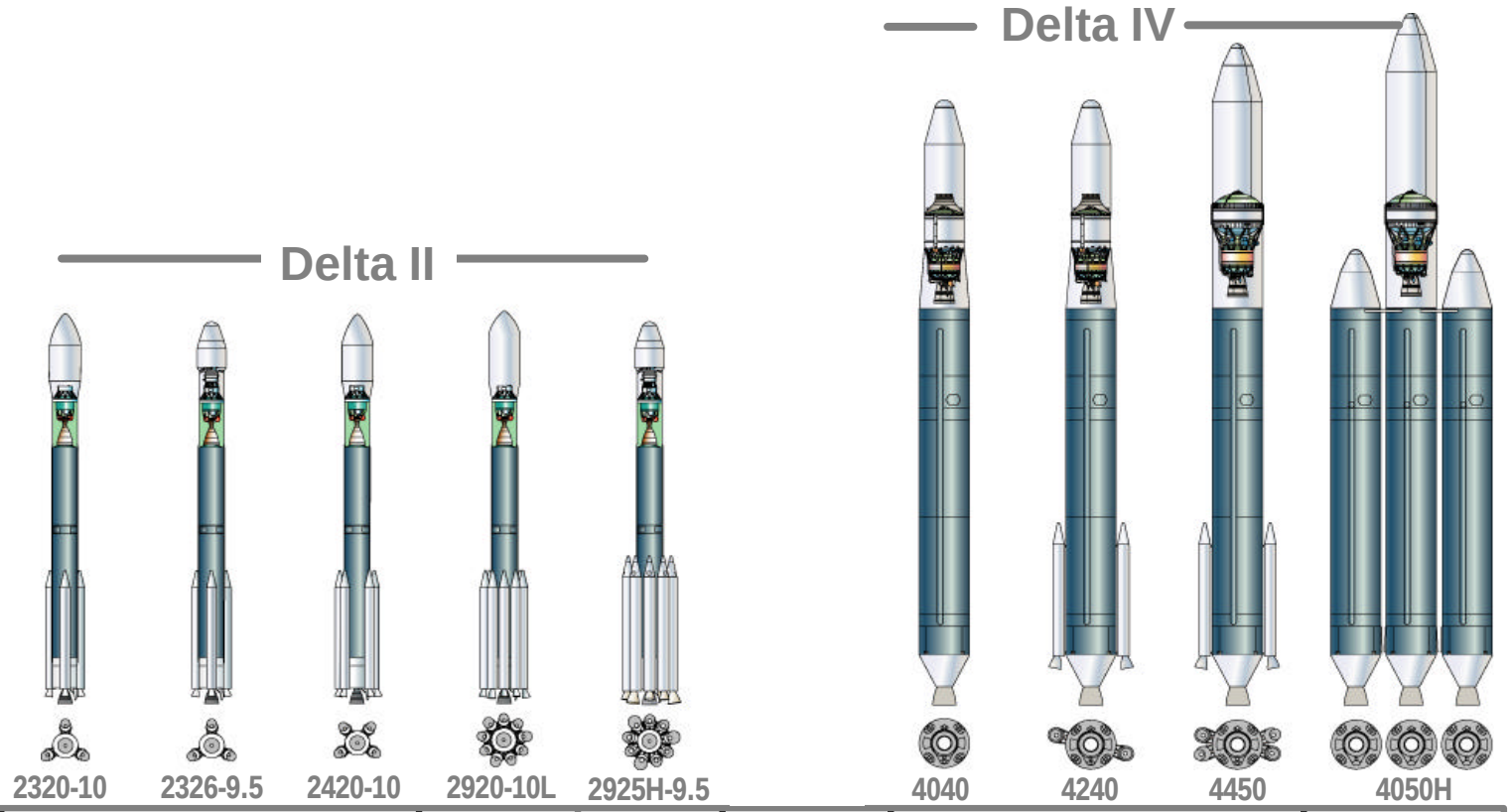
- **Launch Services includes:**
  - **Launch Vehicle**
  - **Standard Services**
  - **Non-Standard services (mission unique options)**
  - **Payload Processing Facility**
  - **Nominal mission specific modifications**
  - **Launch service technical management**
  - **All NASA insight, oversight, & approvals**
  - **Telemetry**
  - **Safety and mission assurance**
  - **Independent launch service assessment**
  - **Launch campaign and day-of-launch management**
- **Nuclear Missions includes:**
  - **Databooks**
  - **Launch site accommodations for nuclear materials**
  - **Material handling/logistics by DOE**
  - **Range Safety requirements**

LAUNCH SERVICE EVALUATION

- **AO Proposers must coordinate with NASA KSC Launch Services – Input directly from commercial Launch Service Providers will not be considered/evaluated**

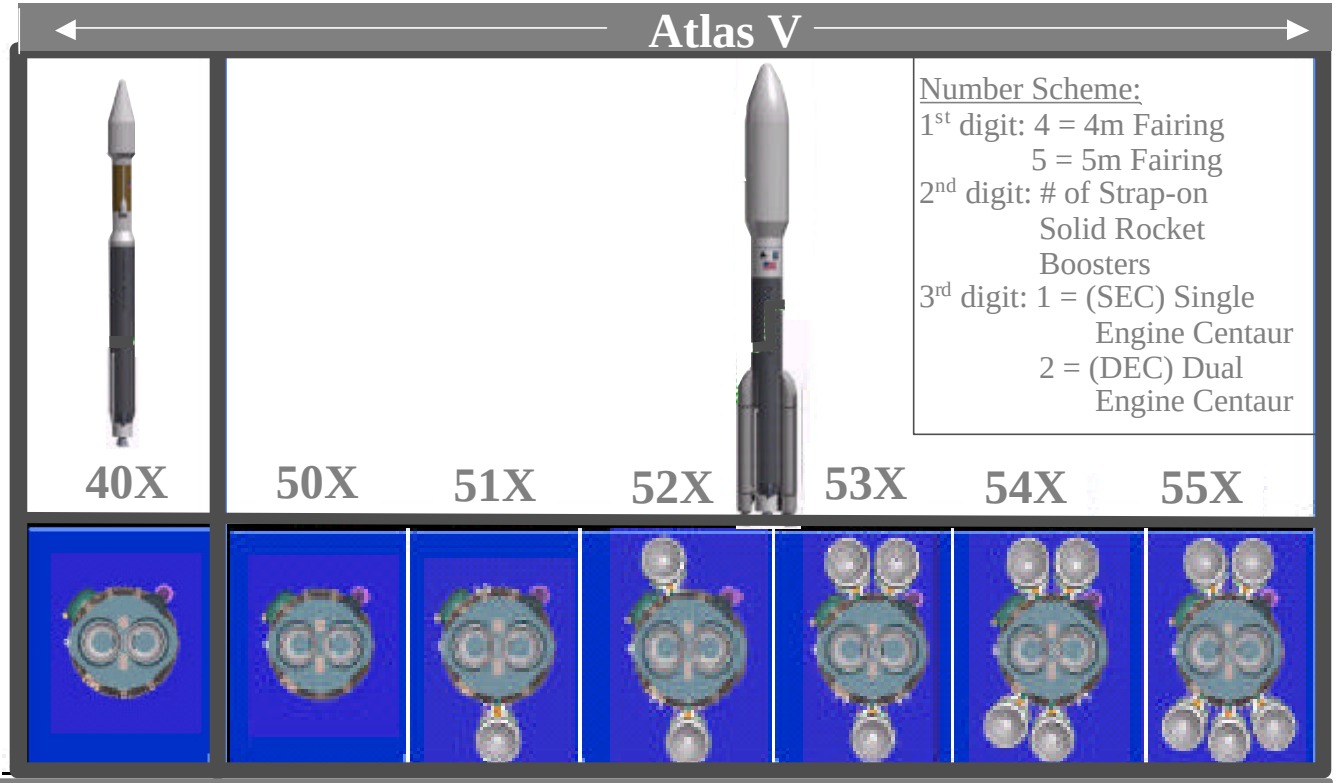
- **Evaluation of Launch Services includes:**
  - **Overall assessment**
  - **Performance (Margin)**
  - **LV to SC Interface**
    - **PLF**
    - **Mechanical Interface**
    - **Environments**
    - **Mission Unique Modifications**
  - **Cost**

NASA Launch Services – The Boeing Company



Launch Service		Delta II Medium/Medium Lite			Delta II	Delta II		Delta IV			Delta IV H
Generic LV Performance[2] (kg):											
LEO (500km, 28.5deg)		2,460	N/A	2,855	4,450	N/A		8,690	11,575	13,100	23,165
SSO (500km)		1,755	N/A	2,120	3,305	N/A		6,915	9,410	10,930	21,040
GTO (35,788km, 28.5deg)		N/A	925	N/A	N/A	2,170		3,985	5,630	6,345	12,650
High Energy	C_3 = 0 km²/s²	N/A	600	N/A	N/A	1,525		2,735	4,075	4,580	9,305
	C_3 = 10 km²/s²	N/A	490	N/A	N/A	1,235		2,115	3,275	3,685	7,810

NASA Launch Services - LMCLS



Launch Service		Atlas V	Atlas V					
Generic LV Performance² (kg):								
LEO (500km, 28.5deg)		9,445/11,500	9,540 (DEC)	9,880/11,490	12,180/13,735	14,045/15,840	15,715/17,450	17,145/18,910
SSO (500km)		N/A	N/A	N/A	N/A	N/A	N/A	N/A
GTO (35,788km, 28.5deg)		4,765 (SEC)	3,880 (SEC)	5,175 (SEC)	6,180 (SEC)	7,105 (SEC)	7,880 (SEC)	8,570 (SEC)
High Energy	C_3 = 0 km²/s²	3,445 (SEC)	2,680 (SEC)	3,765 (SEC)	4,545 (SEC)	5,210 (SEC)	5,820 (SEC)	6,330 (SEC)
	C_3 = 10 km²/s²	2,840 (SEC)	2,150 (SEC)	3,100 (SEC)	3,765 (SEC)	4,345 (SEC)	4,865 (SEC)	5,300 (SEC)

NASA LAUNCH SERVICES MANIFEST

APPROVED
FLIGHT PLANNING
BOARD 9/15/03

	CY '03	CY '04	CY '05	CY '06	CY '07	CY '08	CY '09	CY '10
•SECONDARY (S) •DELTA (D/S) •TAURUS (T/S)		TBD △ SPACETECH 5 NET 12/04 D/S □ ProSEDS -NET 5/04						
•SMALL CLASS (SC) •PEGASUS (P) •TAURUS (SH)	○ P SORCE - 1/25 △ P GALEX - 4/28 P SCISAT - 8/12	P DART - 10/18		P AIM - 9/06 T GLORY* - 12/06*	SC SPACETECH 8 - 6/07 T Orbiting Carbon Observatory - 8/07 P SMEX-10 - 8/07	T GEOSPACE ITM-8/08 SC △ SMEX-11 - 8/08		T GEOSPACE RBM-8/10 T GPMC - 4Q/10 SC SMEX-12 - 8/10
•MEDIUM CLASS (MC) •DELTA 7325/7320 (D3) •DELTA 7425/7426 (D4) •DELTA 7920/7925 (D) •DELTA 7920 H (DH) •TITAN II (T-II) - VAFB	D3 ICESAT/CHIPS 1/12 △ D MER A - 6/10 △ DH MER B - 7/7 △ DH SIRTF - 8/25 D GPB - NET 12/0	D AURA - NET 2/6 △ D4 SWIFT - NET 4/29 △ DH MESSENGER - 5/11 D3 NOAA N - NET 9/15 D △ DEEP IMPACT - 12/30	D4 CLOUDSAT/CALIPSO NET 1/29* D3 NOAA-N' - 10/05 D △ STEREO - 11/15	△ DH DAWN - 5/06 D △ THEMIS (MIDEX-5) 8/06 DH NPP-BRIDGE - 10/06 D3 OCEAN SURFACE TOPOGRAPHY - 12/06	△ DH GLAST - 2/07 D3 STSS - 7/07 D △ OSS OPP - 8/07 △ DH PHOENIX - 8/9 (MARS SCOUT) D △ KEPLER - 10/07 D4(T*) WISE (MIDEX-6) 12/07	D3 AQUARIUS - 3/08	△ DH* MMS - 1/09 △ D* DISCOVERY 11 2/09 D* GEC - 9/30 D △ MARS TELECOM* 10/09 D4 * MIDEX-7 - 12/09	D4 * △ MIDEX-8 - 12/10
•INTERMEDIATE (IC) / HEAVY CLASS (HC) •ATLAS (AIII&AV) •DELTA (DIII&IV) •DELTA IV HEAVY (IVH)		DIV ○ GOES-N - 12/1	DIV ○ GOES-O - 12/05 AV △ MARS RECON ORBITER - 8/10	△ AV-H NEW HORIZONS 1/11 ◇ IC X-37*- 7/06	○ DIV GOES-P - 4/07	IC △ SDO - 4/08 IC △ NEW FRONTIERS 12/08 HC* ◇ OSP DEMO - 4Q/08	IC △ MARS SCIENCE LAB - 10/09* HC △ SIM - 12/09	HC* ◇ OSP* - 4Q/10

* FOR NASA PLANNING PURPOSES
** FAILURE

△ = OSS □ = OSF ⬡ = OBPR ✓ = VAFB LAUNCH
○ = OES ◇ = OAT ⬠ = DOD REIMBURSABLE

E. PONIATOWSKI
C:\SALVAS MANI-11-LG FPB 9/15/03